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WALTER M. DICKIE, M.D., Director

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Relapsing Fever—Symptomatology and Treatment

LEROY H. BRIGGS, M.D.*

Unfortunately there is nothing particularly characteristic about the symptomatology of a paroxysm of relapsing fever which would give a clue to its diagnosis, as the patient's complaints are those common to any generalized infection of short duration without focal localization, such as malaria or influenza. Since the pandemic of 1918-19 we are all too prone to dismiss any fever without signs, lasting a few days, as "influenza," a pitfall all to easy of access. Inasmuch as the treatment of relapsing fever is so specific and effectual, early recognition is essential to cut down the period of disability. The geographical localization, the seasonal incidence, and especially the repetition of attacks at short intervals, should be extremely suggestive and demand an examination of the blood.

The geographical distribution is constantly spreading, but in the main lies in the five to seven thousand foot level of the Sierra on both the east and west sides, with the two big centers the Lake Tahoe and Big Bear Lake districts, where there is a large summer population. As yet no cases have been reported from the great vacation area of the Yosemite. The seasonal incidence is June, July, August and September, months corresponding to the heavy influx of tourist and vacation travel into the mountains. Winter cases are extremely rare, due not so much to the scarcity of population in these regions, as to the hibernation of rodents and vectors.

History of insect bites is obtained in comparatively few instances, since the Ornithodorus tick involved drops off after feeding and leaves no local reaction at the bite. This must be strongly emphasized, as the word "tick" is ineradicably associated in the mind of the laity with the "woodtick" of the genus Dermacentor, which is found imbedded in the skin, with a local reaction due to the associated secondary infection at the site. Then again the larval and nymphal stages are capable of transmitting the disease, and are so small as to be nearly invisible. The absence therefore of a history of insect bites can not be utilized as diagnostic evidence, pro or con. The direct transmission of the spirochaete by infected rodent blood to an abrasion in the skin is a possibility that must at times be considered. The incubation time, as far as has been determined, lies between a week and ten days.

The clinical picture of the disease as it is seen in the western United States evidently is more attenuated than that that occurs in the large endemic centers elsewhere in the world, as judged by the text book descriptions of the latter. There has been no mortality reported in California. The onset of the paroxysm is usually abrupt, frequently being initiated by a chill, with a continuous fever persisting for from two to five days, averaging about three. There is then a similar rapid defervescence, with the afebrile period lasting about double the time of the febrile. This cycle is repeated, the paroxysms of fever in the untreated cases tending to become shorter and less severe, finally ceasing altogether. The fever ranges from 100° to 106°, the average maximum being 104°, with an afternoon fastigium in the majority of instances.

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During the febrile period, besides the initial rigor, there is sweating, frequently nocturnal, generalized aches and pains, malaise and chilling in over 80% of the cases. Nausea and vomiting are not uncommon, but less frequent. Headache, mental hebetude with occasional delirium occur in about 50%. Obviously these symptoms are simply those of any acute generalized infection and are not diagnostic in any way. With the remission, rapid improvement ensues, the patient thinking himself well, until the advent of the next paroxysm arouses the suspicion that the infection is not as simple as was suspected.

The physical signs similarly are noncommittal. In a third of the reported California series a slight enlargement of the spleen was noted, the most constant abnormal finding. Jaundice with enlargement of the liver occurs in a minority, probably due to a mild hepatitis. Labial herpes is seen occasionally, and a macular eruption on the extremities is a rare finding. There is nothing diagnostic about the pulse rate, although as a rule it is comparatively more rapid than in typhoid fever. The blood count is of very little aid, the average being a slight rise with a normal leucocytic formula. Unless there are a number of paroxysms there is no chance in erythrocytes and hemoglobin. The urine, as in any sharp infection, may show the slight amount of albumin and casts of renal irritation.

Apart from the demonstration of the parasite in the blood by smear or animal inoculation, the next most important diagnostic measure is the graph of the temperature curve. Malaria gives neither the long febrile paroxysms nor the longer afebrile periods. The recurrent Pel-Ebstein type fevers do not give the abrupt rise and fall as is found here. Rat bite fever may give a similar course, but the history of a bite by a rat or other rodent is invariably present, and the morphology of the parasite is different. Other infections are either of longer duration, not so sharply recurrent, or give localizing signs, none of which is present in relapsing fever.

In the treatment of the disease we have a specific in the arsenicals, and from the practical standpoint neoarsphenamine given intravenously is the drug of choice. For the fairly mild form of the disease as we see it, a dose of 0.45 gram given at the height of the fever when the spirochaetes are in the blood stream, would seem quite efficacious and at the same time perfectly safe. If lesser doses are used, or if an adequate dose is given in the afebrile period, relapses are apt to occur. In the overwhelming invasions as seen in the tropics, it has been pointed out that the sudden killing of tremendous numbers of parasites with the liberation of endotoxin may produce a dangerous reaction, but this need not be reckoned with as we meet the infection in California. True, a considerable reaction may and does occur from the liberation of protein in the killed parasites, but this rarely does more than make the patient more ill for a few hours, and is counterbalanced by the fact that the spirochaetes are more completely killed by a single large dose than by repeated smaller ones. For children the dosage should be proportionately reduced according to body weight.

As far as prophylaxis goes there is very little the individual can do who is in an infected region. The tick vector is rarely discoverable and biting occurs nearly always without the victim's knowledge. We do know that certain rodents, such as chipmunks and tamarack squirrels, are widely and constantly infected. If recently killed carcasses of these animals are handled, great caution must be used to see that breaks in the skin are not contaminated by their blood.

Protective foods should be included in the menu of every man. These foods are particularly rich in vitamins, and you need vitamins to remain in health. The protective foods include leafy vegetables, fruits and milk. Medical and scientific studies have demonstrated that their use aids in warding off disease, and so helps to increase the life span.

Leafy vegetables include lettuce, romaine, spinach, kale, cabbage, cauliflower, dandelion greens, turnip and beet tops, celery and endive. Besides these, although not leafy vegetables, string beans and tomatoes are rich in protective substances. Every full meal should include two cooked vegetables as well as a vegetable salad, the latter preferably of raw vegetables such as lettuce, tomatoes, celery and carrots.

Oranges, grapefruit and lemon, in other words the citrus fruits; bananas, apples, apricots, grapes, plums, pears, canteloupes, figs, pomegranates are rich in vitamins, especially vitamin C, and should be eaten freely.

Every man should drink at least a pint of milk every day, for milk is the most nearly perfect food known. Dairy products, cheese and butter, also are fine for health. Both milk and cheese are rich in calcium, a mineral which the body must have.—Dr. John L. Rice, Commissioner of Health, New York City.

IMMUNIZATION AGAINST INFECTIOUS DISEASES

In a recent article upon the subject of immunization Dr. W. W. Bauer, Director of the Bureau of Health and Public Instruction of the American Medical Association wrote as follows:

"One of the more modern weapons against contagious diseases is immunization. In order to understand immunization, we must first understand immunity. This word is defined in the dictionary as 'exemption or freedom from' disease. It must be understood at the outset that immunity varies in different individuals for different reasons. Practically no one at any age is naturally immune to smallpox, measles, whooping cough, or rabies, to cite just a few examples. On the other hand, many persons seem to have considerable immunity toward scarlet fever, and immunity against diphtheria varies from almost nothing in young children to a considerable percentage in adults. Therefore, we must consider details of immunity separately for each disease, but there are certain general principles which govern in all instances.

Immunity has been divided, for purposes of better understanding into several classifications, but these may overlap one another. One division of immunity is into active and passive. Active immunity is developed in the body of a patient in response to external stimulation, which may consist either in having the disease and recovering, successfully resisting repeated small exposures without becoming ill, or in response to definitely planned immunizing treatment. Passive immunity is that which is given by injections of antitoxins or serums; it is not developed in the patient's own body. Another division of immunity is into permanent and temporary; these terms explain themselves.

Still another classification is into natural and artificial. Natural immunity is that which exists apparently without previous cause. Probably most immunity which appears to be natural is acquired by repeated small, unrecognized exposures which are successfully resisted. The explanation of artificial immunity is obvious. It will be seen that any form of immunity may belong to several of the above classifications; thus, immunity acquired after recovery from a case of scarlet fever is natural, active, and usually permanent immunity.

In general, it may be said that active immunity is more likely to be permanent, and passive immunity more likely to be temporary. Permanence, however, is also relative, since after a long period of years, even a so-called permanent immunity may weaken sufficiently so that the patient may again catch the disease. This explains why a second attack of a contagious disease, while not common, is definitely known to occur. Also, overwhelming infections may overcome an immunity that would give adequate protection under ordinary conditions.

There are, as indicated above, three general ways in which immunity may be acquired. These are:

1. To have the disease and recover from it. (Risky.)
2. To have numerous small exposures without developing the disease. (Risky.)
3. To receive immunity from specific intentional treatment. (Safe.)

We are interested here primarily in the type of immunity which can be consciously procured by the administration of a stimulating agent. Such substances are known as antigens, which word taken apart means to generate against. An antigen, therefore, is a substance which causes the body to react against it, and to develop defenses against the disease for which that antigen is specific. Antigens protect against only one disease. Well-known antigens are smallpox vaccine, whooping cough vaccine, typhoid fever vaccine, diphtheria toxoid, and Pasteur's vaccine for rabies. The term antigen is merely a general term covering these various immunity-generating substances."

Some parents actually try to scold health into their children. Health, however, is not understandable to children, at least before they reach twelve years, and when we plead with a child to safeguard his health, he may begin to imagine there is something the matter with him; else, he reasons, why should mother or father talk so much about it? A sense of insecurity may develop. Thinking too much about one's body is enough to bring on sickness—mental sickness at any rate—and it is a very difficult condition to cure.

Many of us are victims of the days when child psychology was not so well understood and when nagging was the nearest our parents ever got to constructive discipline. The fears engendered in those early years left an indelible impression that accounts for peculiarities and prejudices which may handicap us for life. Let us avoid passing on this error to the next generation, by remembering that *nagging never pays.—Florida Health Bulletin.*

There is a principle which is a bar against all information, which is proof against all argument and which can not fail to keep a man in everlasting ignorance. That principle is "condemnation before investigation."—Herbert Spencer.

Intelligence is the most potent factor that can be directed against disease.

MORBIDITY

Complete Reports for Following Diseases for Week Ending August 22, 1936

Chickenpox

15 cases: Alameda County 1, Berkeley 3, Oakland 1, Los Angeles County 2, Los Angeles 2, Monrovia 1, Orange County 2, San Bernardino 1, Santa Barbara County 1, Palo Alto 1.

Diphtheria

21 cases: Berkeley 1, Oakland 1, Huntington Park 1, Long Beach 1, Los Angeles 9, Monterey County 1, Orange County 1, Corona 1, San Bernardino County 1, San Diego County 1, San Francisco 2, Santa Barbara 1.

German Measles

12 cases: Alameda 1, Contra Costa County 1, Los Angeles County 1, Glendale 1, Orange 1, Santa Ana 2, Ontario 1, El Cajon 1, San Diego 1, San Jose 1, Davis 1.

Influenza

12 cases: Oakland 3, Westmoreland 1, Bakersfield 1, Los Angeles 7.

Malaria

7 cases: Los Angeles County 1, Sacramento County 1, San Joaquin County 3, Yuba City 1, California 1.*

Measles

56 cases: Albany 1, Berkeley 2, Oakland 1, Contra Costa County 1, Los Angeles County 2, Burbank 1, Compton 1, Glendale 1, La Verne 1, Los Angeles 18, Montebello 1, Pasadena 1, Redondo 1, San Marino 2, Madera County 1, Orange County 7, La Habra 1, San Diego County 3, National City 1, San Diego 2, San Francisco 3, San Luis Obispo 1, Santa Barbara County 1, Santa Barbara 1, Ventura County 1.

Mumps

126 cases: Albany 1, Berkeley 5, Oakland 1, Piedmont 2, Contra Costa County 1, Kern County 8, Los Angeles County 8, Burbank 6, Glendale 4, Huntington Park 1, Inglewood 1, Long Beach 2, Los Angeles 19, Montebello 1, Pasadena 4, Santa Monica 2, Whittier 1, South Gate 1, Bell 1, Orange County 2, Brea 1, Fullerton 1, Orange 2, Santa Ana 7, La Habra 1, Corona 2, Riverside 5, San Diego County 11, Chula Vista 1, National City 2, San Diego 8, Santa Maria 1, San Jose 2, Yuba City 1, Porterville 1, Woodland 9.

Pneumonia (Lobar)

27 cases: Oakland 5, Los Angeles County 2, Azusa 1, Glendale 1, Long Beach 1, Los Angeles 14, Santa Monica 1, Sacramento 1, San Diego 1.

Scarlet Fever

67 cases: Alameda County 1, Berkeley 1, Oakland 6, Fresno County 2, Fresno 1, Los Angeles County 10, Alhambra 1, Avalon 1, Compton 2, Los Angeles 4, Pasadena 2, Santa Monica 2, Marin County 1, Merced 4, Santa Ana 1, Sacramento County 1, Sacramento 7, Ontario 1, San Diego 4, San Francisco 5, Stockton 2, South San Francisco 1, Lompoc 3, Modesto 1, Oakdale 1, Sutter County 1, Ventura County 1.

Typhoid Fever

12 cases: Lake County 1, Santa Ana 1, Sacramento 1, San Bernardino County 1, San Diego 2, Solano County 1, Stanislaus County 1, Tulare County 2, California 2.*

Whooping Cough

187 cases: Alameda County 3, Albany 3, Berkeley 4, Oakland 8, Fresno County 4, Fresno 1, Kern County 1, Los Angeles County 21, Alhambra 1, Glendale 2, Inglewood 2, Los Angeles 36, Pasadena 4, San Gabriel 6, Santa Monica 2, South Gate 1, Madera 1, Yosemite 2, Salinas 1, Laguna Beach 1, Riverside 1, Sacramento County 1, Sacramento 23, San Bernardino 1, San Diego County 7, San Diego 12, San Francisco 19, Santa Barbara 15, Tehama County 1, Exeter 1, Ventura County 1, Woodland 1.

Meningitis (Epidemic)

2 cases: Los Angeles 1, Sacramento 1.

Dysentery (Amoebic)

4 cases: Los Angeles County 1, Los Angeles 1, Santa Barbara County 1, Tulare County 1.

Dysentery (Bacillary)

7 cases: Los Angeles 4, Napa County 1, San Joaquin County 1, California 1.*

Pellagra

One case: Oakland.

Poliomyelitis

15 cases: Fresno County 1, San Joaquin 1, Los Angeles County 2, Los Angeles 1, Montebello 1, Bell 1, Salinas 1, Orange County 1, Santa Ana 1, Hollister 1, San Diego 1, Tulare County 1, Ventura County 2.

Tetanus

One case: Ventura County.

Trachoma

9 cases: Riverside County.

Encephalitis (Epidemic)

One case: Berkeley.

Food Poisoning

3 cases: San Francisco.

Undulant Fever

4 cases: Los Angeles County 1, Monterey County 1, Napa County 1, Placer County 1.

Actinomycosis

2 cases: San Francisco 1, Colma 1.

Coccidioidal Granuloma

One case: Bakersfield.

Relapsing Fever

One case: Plumas County.

Rabies (Animal)

26 cases: Berkeley 1, Imperial County 1, Los Angeles County 1, Long Beach 5, Los Angeles 9, Redondo 1, Lynwood 1, Madera 2, San Bernardino 3, San Joaquin County 1, Santa Maria 1.

Our chief enemies at present are heart disease, cancer, pneumonia, tuberculosis and syphilis. If the full facts were known, as Dr. Osler said, syphilis would probably come first. Syphilis is the biggest killing disease in the community. It and tuberculosis are undoubtedly the greatest present contributors to the total mortality prior to the approach of old age. By the removal of tuberculosis and syphilis, most of the preventable deaths from the age of 15 to 65 would be avoided.—Sir Arthur Newsholme, M.D.

The key to the world of the future and to the wise fraternity of all races lies in the liberation of the child from the bondage of others' error and sin; from disease and debility, from desertion and want, from ignorance and passion above all, that are visited on the helpless to the third and fourth generation. The heart of a child is friendly to all; like the baby of Della Robbia its limbs are bound, but its arms go out to its fellows. Its single claim is to be allowed to love; its one revenge to die if, for an hour, we neglect it.—Romain Rolland.

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* Cases charged to "California" represent patients ill before entering the state or those who contracted their illness traveling about the state throughout the incubation period of the disease. These cases are not chargeable to any one locality.

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